



**State of Louisiana
Department of Natural Resources
Coastal Engineering Division**

**2006/2007 Annual Inspection
Report**

for

**FOUR MILE CANAL TERRACING
AND SEDIMENT TRAPPING
PROJECT**

State Project Number TV-18
Priority Project List 9

March 6, 2007
Vermilion Parish

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Table Of Contents

I. Introduction.....	1
II. Inspection Purpose and Procedures	1
III. Project Description and History.....	2
IV. Summary of Past Operation and Maintenance Projects.....	3
V. Inspection Results	3
VI Conclusions and Recommendations	3

Appendices

Appendix A	Project Features Map
Appendix B	Photographs
Appendix C	Three Year Budget Projections
Appendix D	Field Inspection Notes
Appendix E	Map showing areas to be monitored

I. Introduction

The Four Mile Canal Terracing and Sediment Trapping (TV-18) project is located approximately 4 miles (6.44 km) south of Intracoastal City in Vermilion Parish, Louisiana, and includes Little White Lake and the portion of Little Vermilion Bay immediately west of Four-Mile Canal also known as the Vermilion River Cutoff (Appendix A). The total project area comprises approximately 2,269 acres.

The Four Mile Canal Terracing and Sediment Trapping Project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended and approved on the ninth Priority Project List. The Four Mile Canal Project has a twenty year (20 year) economic life, which began in May 2004.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Four Mile Canal Terracing and Sediment Trapping Project (TV-18) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, LDNR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan, 2005). The annual inspection report also contains a summary of maintenance projects which were completed since completion of constructed project features and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since completion of the Four Mile Canal Project are outlined in Section IV.

An inspection of the Four Mile Canal Terracing and Sediment Trapping Project (TV-18) was held on March 6, 2007 under clear skies and cool temperatures. In attendance were Stan Aucoin and Herb Juneau from LDNR, and John Foret of NOAA Fisheries. All parties met at the Lafayette Field Office of CED and traveled to Intracoastal City in Vermilion Parish, LA. The annual inspection began at the site of the terraces constructed in Little White Lake.

The field inspection included a visual inspection of the project site. Staff gauge readings were used, when available, to determine approximate elevations of water and earthen terraces. Photographs were taken at each project feature (see Appendix B) and Field Inspection notes were completed in the field to record measurements and deficiencies (see Appendix D).

III. Project Description and History

The Flood Control Act of 18 August 1941 enacted by the United States Congress provided for improvements in the Vermilion River. Vermilion River Cutoff, an 8 ft by 80 ft (2.44 m by 24.38 m) channel from the -8 foot contour in the Vermilion Bay to the Gulf Intracoastal Waterway (GIWW) was constructed for improving navigation from Lafayette, LA to the -8 foot (-2.44 m) contour in Vermilion Bay and to improve flood control from Port Barre, LA to the Vermilion Bay via Bayou Teche, Bayou Fusilier and Vermilion River. The materials excavated to build the canal were deposited in spoil banks along the canal. This prevented the river waters from nourishing the adjacent marsh (USACE 1993; HNTB 2002). The main cause of marsh loss in this area is believed to be shoreline erosion. From the 1978 Louisiana Department of Transportation and Development (LDOTD) inventory and assessment of shoreline erosion in coastal Louisiana, the Abbeville 15 minute Quadrangle, which depicts Vermilion Bay near Onion Bayou, documents an erosion rate of 1.6 ft/yr (0.5 m/yr) and just adjacent to that in the Cheniere Au Tigre & Abbeville 15 minute Quadrangle, which is Vermilion Bay (Mud Point to Lake Cleodis) has an erosion rate of 2.6 ft/yr [0.8 m/yr] (Adams et al. 1978). Shoreline change, specifically in the project area, calculated by USGS was 2.86 ft/yr (0.87 m/yr) and island area change was 0.64 acres/yr (0.26 ha/yr [2003]). A combination of wave and wake erosion continues to deteriorate this area, which is relatively unprotected and affected by storm events emerging from Vermilion Bay. This erosion prevents sub-aerial marsh development from sediments introduced to the area by the GIWW through the Vermilion River and Four-Mile Canal (LDNR 1999).

The construction of terraces in Little White Lake and Vermilion Bay will buffer existing marsh against shoreline erosion by reducing wave and wake energy. Marsh will immediately be created by planting *S. alterniflora* along the crowns and slopes of the constructed terraces. Additionally, new marsh will be created as freshwater and suspended sediments introduced from Four Mile Canal and the Vermilion River are dispersed through the project area via conveyance channels, and trapped in the shallow open water adjacent to the terraces. In doing so, terraces may indirectly reduce water-column turbidity within the project area. This, in conjunction with decreased wave and wake energy, will create habitat suitable for the colonization by submerged aquatic vegetation (SAV). Fisheries habitat may be enhanced by the marsh edge created by the terraces and the propagation of SAV. Conveyance channels may also promote the exchange of organisms and organic material within and through the project area (2005 DNR OM&M Report).

The principal project features include:

1. 26,300 linear feet of earthen terraces constructed in Little White Lake
2. 40,300 linear feet of earthen terraces constructed in Little Vermilion Bay
3. Smooth Cordgrass plantings on all terraces

IV. Summary of Past Operation and Maintenance Projects

General Maintenance: Below is a summary of completed maintenance projects and operation tasks performed since May 2004, the construction completion date of the Four Mile Canal Terracing and Sediment Trapping Project.

None as yet required.

Structure Operations:

There are no active operations associated with this project.

V. Inspection Results

Site 1—Earthen terraces

The terraces appear to be in fairly good condition. Terraces along the Vermilion River Cut-Off and on the southwestern rim of the project are eroding but are still functional. Submerged aquatic vegetation is becoming established between the terraces. No maintenance needed at this time. (Photos: Appendix B, Photo 1-4)

Site 2—Vegetation plantings

Vegetation has spread throughout the terraces. Effects from the hurricane are no longer evident. A staff gauge needs to be installed in the vicinity of the Little White Lake terraces. No other maintenance needed at this time.

VI. Conclusions and Recommendations

The Four Mile Canal Terracing and Sediment Trapping Project is in very good condition and functioning as intended. Staff gauges should be installed at convenient locations when other survey work in the area is required. Projected maintenance for CY2007:

- Install staff gauge

Appendix A
Project Features Map

Annual Inspection Report
 FOUR MILE CANAL TERRACING AND SEDIMENT TRAPPING PROJECT
 State Project No. TV-18



Appendix B

Photographs

Annual Inspection Report
FOUR MILE CANAL TERRACING AND SEDIMENT TRAPPING PROJECT
State Project No. TV-18



Photo 1—terraces along Vermilion River Cut-Off



Photo 2—terraces in Little Vermilion Bay



Photo 3—terraces in Little White Lake



Photo 4—terraces in Little White Lake

Appendix C

Three Year Budget Projection

Annual Inspection Report
 FOUR MILE CANAL TERRACING AND SEDIMENT TRAPPING PROJECT
 State Project No. TV-18

FOUR MILE CANAL/ TV18 / PPL 9
Three-Year Operations & Maintenance Budgets 07/01/2007 - 06/30/10

<u>Project Manager</u>	<u>O & M Manager</u>	<u>Federal Sponsor</u>	<u>Prepared By</u>
Herb Juneau	Herb Juneau	N/A	Stan Aucoin

	2007/2008	2008/2009	2009/2010
Maintenance Inspection	\$ 5,407.00	\$ 5,570.00	\$ 5,737.00
Structure Operation			
Administration		\$ -	\$ -
Maintenance/Rehabilitation			

07/08 Description: Install staff gauge

E&D	
Construction	\$5,000.00
Construction Oversight	
Sub Total - Maint. And Rehab.	\$ 5,000.00

08/09 Description

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

09/10 Description:

E&D	\$ -
Construction	\$ -
Construction Oversight	\$ -
Sub Total - Maint. And Rehab.	\$ -

	2007/2008	2008/2009	2009/2010
Total O&M Budgets	\$ 10,407.00	\$ 5,570.00	\$ 5,737.00

O & M Budget (3 yr Total)	\$ 21,714.00
Unexpended O & M Budget	\$ 22,199.65
Remaining O & M Budget (Projected)	\$ 485.65

Appendix D

Field Inspection Form

Annual Inspection Report
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 State Project No. TV-18

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: TV-18 Four Mile Canal

Date of Inspection: March 6, 2007 Time:

Structure No. N/A

Inspector(s): Stan Aucoin, Herb Juneau (LDNR)
 John Foret (NMFS)

Structure Description: Terracing and Sediment Trapping

Water Level NAVD

Type of Inspection: Annual

Weather Conditions: Clear and cool

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Steel Bulkhead / Caps	N/A				
Steel Grating	N/A				
Stop Logs	N/A				
Hardware	N/A				
Timber Piles	N/A				
Timber Wales	N/A				
Galv. Pile Caps	N/A				
Vegetation	Good				
Signage / Supports	N/A				
Rip Rap (fill)	N/A				
Eathern Embankment Terraces	Good			1,2, 3 & 4	Expected erosion on sacrificial terraces. Significant erosion on terraces adjacent to Vermilion River Cut Off.

What are the conditions of the existing levees?
 Are there any noticable breaches?
 Settlement of rock plugs and rock weirs?
 Position of stoplogs at the time of the inspection?
 Are there any signs of vandalism?

Appendix E

Locations to be Monitored